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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,643	05/02/2001	Yuzo Kano	19036/37333	6598

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EXAMINER

EDMONDSON, LYNNE RENEE

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 08/13/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,643

Applicant(s)

KANO ET AL.

Examiner

Lynne Edmondson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-8, 11, 12, 14, 16-26 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-8, 11, 12, 14, 16-26 and 38-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10. 6) ☐ Other:

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DETAILED ACTION

Claim Objections

1. Claims 11, 12 and 14 are objected to because of the following informalities:

Claims 11 and 12 are dependent from cancelled claim 10. Claim 14 is dependent from canceled claim 13. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

1. Claims 5, 12 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Wykes (USPN 5697544).

Wykes teaches a spot joining tool (5) comprising a column shaped shoulder portion (2) and a pin protruding from the shoulder, a substantially L-shaped frame (figure 8), a linear guide (not numbered between 53 and 55) provided on an upper portion of the frame, a rotation motor (24) provided on the guide member, a motion

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motor (18) and a receiving member (50) for receiving workpieces (figures 7 and 8 and col 3 lines 18-57). The shape of the probe forms a concave portion at the joint spot.

2. Claims 5, 11, 12, 14, 26, 38 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Okamura et al. (USPN 6299050 B1).

Okamura teaches a spot joining tool (1) comprising a column shaped shoulder portion (1a) and a pin (1b) protruding from the shoulder, a substantially L-shaped frame (figure 4), a linear guide (75, 79) provided on an upper portion of the frame, a rotation motor (4) provided on the guide member, a motion motor (65) and a receiving member (76) for receiving two or more metal workpieces (figure 5, col 8 lines 5-36 and col 15 lines 15-28). A ball screw (17,19) is mounted on the frame comprising a screw shaft and nuts (not numbered on 17). The process is used to manufacture automobile parts or railway vehicles (col 4 lines 26-34). The shape of the probe forms a concave portion at the joint spot. The method comprises the steps of rotating the tool and inserting both the pin and shoulder into the work (figure 3 and col 7 lines 30-66), agitating portions of the work and pulling out the tool. The receiving member has a flat surface, which applies a pressing (hold down) force (figure 12 and col 15 line 63 – col 16 line 6). See also Okamura claims 1, 9 and 10.

3. Claims 18, 19, 21-26, 39 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Aota et al. (USPN 6585443 B2).

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Aota teaches a spot joining method comprising rotating a joining tool (70) comprising a column shaped shoulder portion (71) and a pin (72) protruding from the shoulder, inserting the pin and shoulder into a predetermined spot of two or more lapped works (figures 1, 4 and 18 and col 5 lines 41-55) which agitates the portions of the lapped works in the joint spot and pulling out the tool vertically. A receiving member (50, 111) having a flat receiving face, which receives pressure, is disposed opposite the pin (figure 3 and col 6 line 65 – col 7 line 2). The lapped works are three dimensionally shaped works (figure 1) made of metal (col 1 lines 12-25). The process is used to manufacture automobile parts or railway vehicles (col 2 lines 13-31 and col 6 lines 42-59). The shape of the probe forms a concave portion at the joint spot (figure 2). It is noted that a similar automobile plate can be formed by inserting the pin into the lapped works without insertion of the shoulder.

4. Claims 18, 21-23 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Ezumi et al. (USPN 6536651 B2).

Ezumi teaches a spot joining method comprising rotating a joining tool (50) comprising a column shaped shoulder portion (51) and a pin (52) protruding from the shoulder, inserting the pin and shoulder into a predetermined spot of two or more lapped works (figure 2, col 1 lines 32-45 and col 3 lines 25-50) which agitates the portions of the lapped works in the joint spot and pulling out the tool vertically. The lapped works are flat metal plates (figure 4A). The shape of the probe forms a concave portion at the joint spot (figure 4B). See also Ezumi claims 1, 3 and 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 16-25 and 39 are rejected under 35 U.S.C. 103(a) as being obvious over Okamura et al. (USPN 6299050 B1) in view of Heideman et al. (USPN 6053391).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned

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by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Okamura teaches a spot joining tool (1) comprising a column shaped shoulder portion (1a) and a pin (1b) protruding from the shoulder, a substantially L-shaped frame (figure 4), a linear guide (75, 79) provided on an upper portion of the frame, a rotation motor (4) provided on the guide member, a motion motor (65) and a receiving member (76) for receiving two or more metal workpieces (figure 5, col 8 lines 5-36 and col 15 lines 15-28). A ball screw (17,19) is mounted on the frame comprising a screw shaft and nuts (not numbered on 17). The process is used to manufacture automobile parts or railway vehicles (col 4 lines 26-34). The shape of the probe forms a concave portion at the joint spot. The method comprises the steps of rotating the tool and inserting both the pin and shoulder into the work (figure 3 and col 7 lines 30-66), agitating portions of the work and pulling out the tool. The receiving member has a flat surface, which applies a pressing (hold down) force (figure 12 and col 15 line 63 – col 16 line 6). However, there is no disclosure of a joining gun or robot. Neither are lapped works disclosed.

Heideman teaches a spot joining tool and method for joining large metal panels (col 1 lines 10-26) comprising the steps of rotating a joining tool having a pin around an axis with the pin pressed against the lapped works (col 2 lines 55-65) and inserted into the predetermined joint spot, stirring and fusing the lapped works and thereafter pulling out the tool (col 5 lines 54-67). The members have flat faces against which the tool presses exerting a force against the lapped works (figure 4) and are disposed on a flat

receiving member (backing plate) (col 5 lines 37-67). The joining device is a gun on the wrist of an articulated robot (col 4 lines 20-35). The large panels which do not have size limitations (col 1 lines 10-26) would encompass the instantly claimed automobile and rail panels. The pin comprises a screw (threaded member, col 4 lines 51-61) with a raised central portion descending from an inverted conical shape with rounded corners as shown in figures 2 and 3 but can take a variety of shapes (col 3 lines 36-62). It is noted that although there is no disclosure of the shoulder being inserted during process, the resulting product will be identical. Friction stir welding with only insertion of the pin will create a fine-grained joint structure as would shoulder insertion.

It would have been obvious to one of ordinary skill in the art at the time of the invention that manual operation of the welding gun is an obvious variation of automated operation of the gun by a robot, both of which would facilitate large panel operations such as the welding of automobile or railway car panels and thereby make the welded structure with high reliability (Okamura et al. USPN 6299050 B1). Lapped arrangements are obvious variations of abutted arrangements and are joined in the same manner.

6. Claims 6-8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wykes (USPN 5697544) in view of Thompson (USPN 6302315 B1).

Wykes teaches a spot joining tool (5) comprising a column shaped shoulder portion (2) and a pin protruding from the shoulder, a substantially L-shaped frame (figure 8), a linear guide (not numbered between 53 and 55) provided on an upper

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portion of the frame, a rotation motor (24) provided on the guide member, a motion motor (18) and a receiving member (50) for receiving workpieces (figures 7 and 8 and col 3 lines 18-57). The shape of the probe forms a concave portion at the joint spot. However, the motors are not further disclosed.

Thompson teaches a spot joining method comprising the steps of rotating a joining tool having a pin around an axis with the pin pressed against positioned works and inserted into the predetermined joint spot, stirring and fusing the works and thereafter pulling out the tool (col 2 lines 23-40). The joining device comprises an induction motor (col 4 lines 46-52) and a servo motor (col 5 line 42 – col 6 line 3 and col 4 lines 53-67) which are used to rotate the tool and move it along an axis. The motors are provided on a frame (22) comprising a moveably attached linear guide (50), attached to a rail (64) which is parallel the tool axis (col 4 lines 18-67). A screw shaft comprising a ball screw (56) is mounted on the frame and driven by a motor with a nut mounted on the guide shaft (col 4 lines 39-52, col 5 lines 1-4 and col 10 line 53 – col 11 line 15). See also figure 1 and Thompson claims 1, 2 and 13. The device comprises a receiving member (26) having a flat surface and columns (109) opposite the joining tool (figure 4 and col 6 lines 5-24). The lower part of the frame forms an L shape (figure 1). Parts are metal (col 1 lines 10-26). Figure 5 shows the pin (94) having a raised central portion descending from a column shaped shoulder having cylindrical end face at a right angle. See Thompson claims 1, 2, and 7-14.

It would have been obvious to one of ordinary skill in the art at the time of the invention that lap welding is an obvious variation of butt-welding and would be

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performed by the same type of tool. Use of conventional servomotors and induction motors would facilitate computer control and allow instant, accurate adjustments during processing (Wykes, col 1 lines 53-60 and col 4 lines 3-20).

Response to Arguments

7. Applicant's arguments with respect to claims 5-8, 11, 12, 14, 16-26 and 38-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kashiki et al. (US 2003/029903 A1, L-frame), Iwashita (USPN 6601751 B2), Aota et al. (USPN 6050474, auto and rail bodies, screw), Thomas et al. (USPN 54063170, motors and tool), Kinton et al. (USPN 6050475, motors, shoulder shape, frame, guide), Midling et al. (USPN 5813592, shoulder insert), Rosen et al. (USPN 6045027, lap and pressure) and Boon (USPN 6325273, shoulder insert, lap).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson
Examiner
Art Unit 1725

A handwritten signature in cursive script, followed by the date 8/6/03.

LRE
August 6, 2003